

MONTHLY WEATHER REVIEW.

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The MONTHLY WEATHER REVIEW is based on data from about 3500 land stations and many ocean reports from vessels taking the international simultaneous observation at Greenwich noon.

Special acknowledgment is made of the data furnished by the kindness of cooperative observers, and by R. F. Stupart, Esq., Director of the Meteorological Service of the Dominion of Canada; Señor Manuel E. Pastrana, Director of the Central Meteorological and Magnetic Observatory of Mexico; Camilo A. Gonzales, Director-General of Mexican Telegraphs; Capt. I. S. Kimball, General Superintendent of the United States Life-Saving Service; Commandant Francisco S. Chaves, Director of the Meteorological Service of the Azores, Ponta Delgada, St. Michaels, Azores; W. N. Shaw, Esq., Director Mete-

orological Office, London; H. H. Cousins, Chemist, in charge of the Jamaica Weather Office; Rev. L. Gangoiti, Director of the Meteorological Observatory of Belen College, Havana, Cuba.

As far as practicable the time of the seventy-fifth meridian is used in the text of the MONTHLY WEATHER REVIEW.

Barometric pressures, both at land stations and on ocean vessels, whether station pressures or sea-level pressures, are reduced, or assumed to be reduced, to standard gravity, as well as corrected for all instrumental peculiarities, so that they express pressure in the standard international system of measures, namely, by the height of an equivalent column of mercury at 32° Fahrenheit, under the standard force, i. e., apparent gravity at sea level and latitude 45°.

FORECASTS AND WARNINGS.

By Prof. ALFRED J. HENRY, temporarily in charge of Forecast Division.

The remarkable period of cold weather east of the Rocky Mountains which began in April came to a close in Texas, Oklahoma, Arkansas, and Louisiana in the early part of June. From the Lake region and the Ohio Valley eastward to the Atlantic it continued until about the middle of the month, thus completing a period of continuous cold weather in those districts which is unparalleled in the history of the weather service. Previous cold spells occurred in 1857, 1874, and 1875, but in these cases the cold weather did not extend into the month of June as in the present year. The effect of this cold weather was to greatly retard the growth of vegetation up to about the middle of the month. In Colorado and over the Rocky Mountain districts the cold weather of June prevented a rapid melting of the snow, and as a consequence there will be an abundance of water for irrigating purposes.

The month opened with a well-defined low (barometer, 29.50 inches,) central in southern Indiana, and a high (barometer, 30.10 inches,) central over New England. Altho pressure fell over New England and the Lake region, the center of this storm remained almost stationary for twenty-four hours, during which time a secondary center developed off the Virginia coast; in the meantime cloudy, rainy weather, with fresh northeast winds, prevailed over New England and the Middle Atlantic States and thence westward to Lake Michigan. Under the conditions as described, the temperatures ranged from 8° to 20° below the seasonal average thruout the region of easterly winds. The secondary center which developed over the Virginia coast on the 2d soon became the main storm, and as such drifted slowly northeastward along the coast. Meantime the drift of the surface winds over New England, the Middle Atlantic States, and the Lake region continued from an easterly quarter; the weather was therefore cloudy and cold with occasional rain.

An explanation of the failure of the Ohio Valley low to move in its normal path would throw much light on the cause or causes of the cold weather. Such failure can hardly be ascribed to the interposition of high pressure over New England, since the barometer continued to fall in that district. A second fact, that as yet lacks explanation, is that a shift of the winds from easterly to southerly, which almost universally causes a rise in temperature in Atlantic coast districts, generally failed to do so during the continuance of the cold weather. For example, on the 5th a well-defined area of low pressure, with fairly steep pressure gradients, past eastward from the

Lake region to the mouth of the St. Lawrence. This storm caused the winds over New England and the Middle Atlantic States to shift to southerly, but the temperature did not rise as generally happens in a case of this sort. It would seem as if either the lower layers of the atmosphere were chilled to a great extent, both vertically and horizontally, or else the period of southerly winds was too short to actually transport warmer air from lower to higher latitudes.

The change in the drift of the highs and lows which terminated the cool weather in northeastern districts occurred on the 16th. Three days previous to that date an area of high pressure appeared over Lake Superior and gradually worked south-southeastward so that by the 16th it had reached the Ohio Valley with its longer axis running northeast and southwest.

The significance of a southward as compared with an eastward movement of an area of high pressure lies in the fact that the former gives an opportunity for the transfer of the balance of pressure from the north to the south, as a result of which the winds over the central valleys and northern districts become southerly and remain so until pressure in the northern part of the country again becomes greater than in the southern.

Normal temperatures were reached in northeastern districts on the 17th and continued thereabout until the closing days of the month when a repetition of the pressure conditions which had occurred earlier in the month caused two days of cold, rainy weather, with easterly winds in New England and the Middle Atlantic States.

A period of cold weather set in west of the Rocky Mountains on the 13th and continued with but little interruption until the 19th. During its continuance light to heavy frosts occurred in Nevada, Utah, northern Arizona, Colorado, and Wyoming and snow fell in the mountain districts of California, Oregon, Idaho, and Montana. A depth of 4 inches was recorded at Bellview, Idaho, on the 22d instant. Light snow was also recorded at Cleveland, Ohio, on the 5th, and frosts occurred east of the Rocky Mountains, as follows: Week ending June 3, light to heavy frosts were general in the Lake region, Ohio Valley, New England, and the Middle Atlantic States, light frosts also occurring as far south as western North Carolina, northern Alabama, and Arkansas; week ending June 10, light frosts occurred in the western portion of the upper Lake region and in the lower Lake region; week ending